Office for National Statistics

Productivity Statistics User Group 2015

Multi-Factor Productivity and Capital Services

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Capital Services

- Conceptually preferable to using net capital stocks as a measure of capital input in MFP/TFP frameworks
- Capture the **flow** into production coming from the **stock** of capital assets
- **Produced using the following components:**
  - **Productive capital stocks:**
    - Stocks use geometric (declining balance) depreciation
    - Allows age-efficiency and age-price profiles to be equal
  - **User costs of capital**
    - Size of a capital stock of an asset relative to another doesn't represent its relative contribution to production, user costs (proxied using rental functions) are conceptually preferable
    - Some assets used up more quickly so should contribute more to production in a time period

User costs of capital

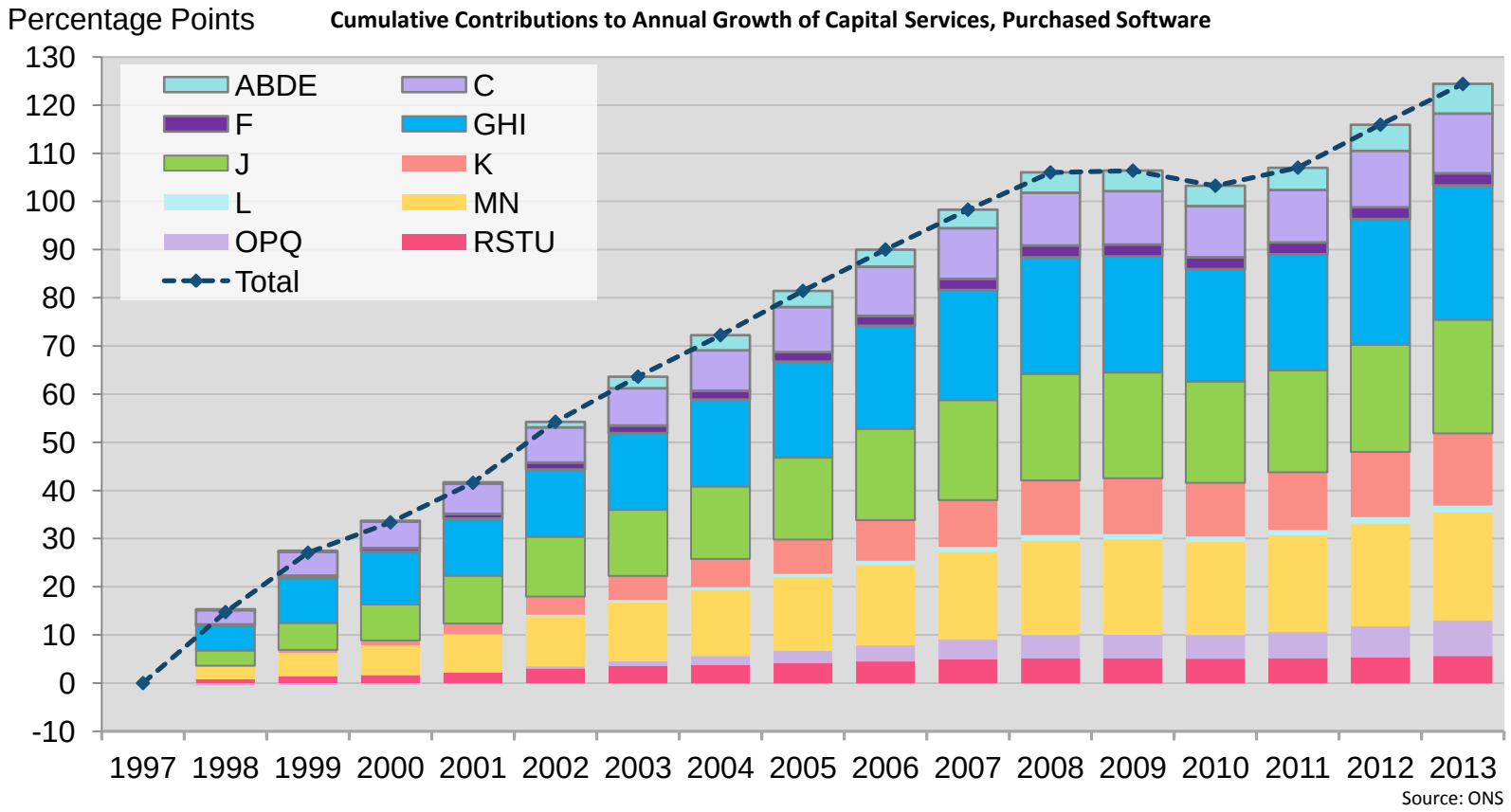
- User costs represent the cost of owning an asset
- **They have three components:**
  - **Deterioration:**
    - If an asset has a long life length, it will use up a small amount of productive potential each time period, so small deterioration cost
  - **Revaluation:**
    - If an asset price falls over time, then this is a positive cost to the user, who could now buy the asset more cheaply
    - If an asset price rises over time, (often the case with buildings) this represents a gain (or negative cost) to the user
  - **Cost of finance:**
    - Proxied using endogenously calculated industry level rates of return

User costs and wealth shares

	Wealth share, 2011	User cost share, 2011
	%	%
Buildings, excluding dwellings	60%	56%
Vehicles	4%	4%
Plant, machinery and computers	27%	20%
Software	3%	12%
Artistic originals	2%	2%
Mineral extraction rights	0%	0%
Cultivated assets	0%	0%
Research and development	3%	7%

Why does this matter so much?

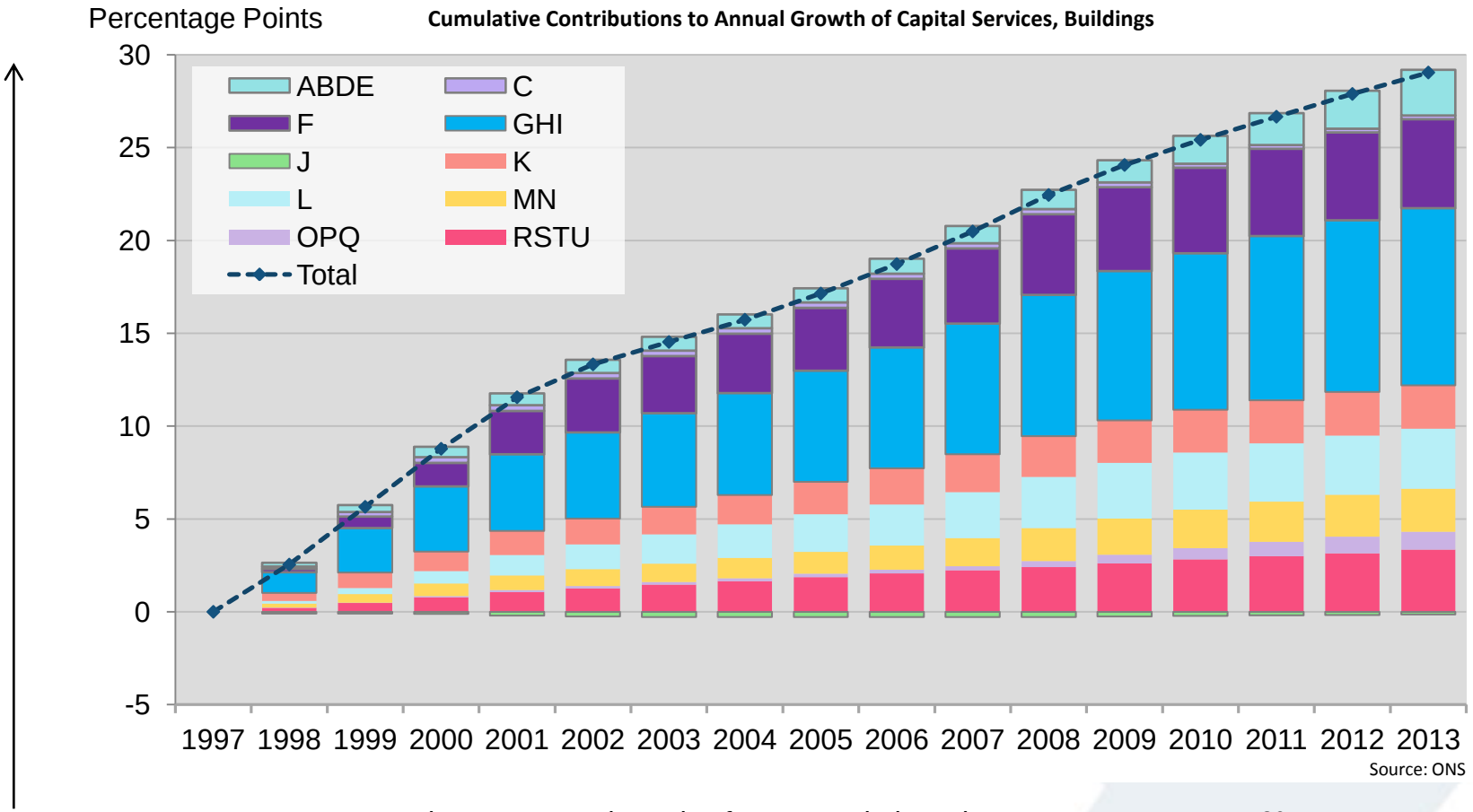
Purchased software growth



Note large scale

ABDE: Other Production, C: Manufacturing, F: Construction, GHI: Retail, Transport, & Accommodation and Food Services, J: Information & Communication, K: Finance & insurance, L: Real Estate, MN: Professional & Scientific, Admin & Support, OPQ: Government services, RSTU: Other Services

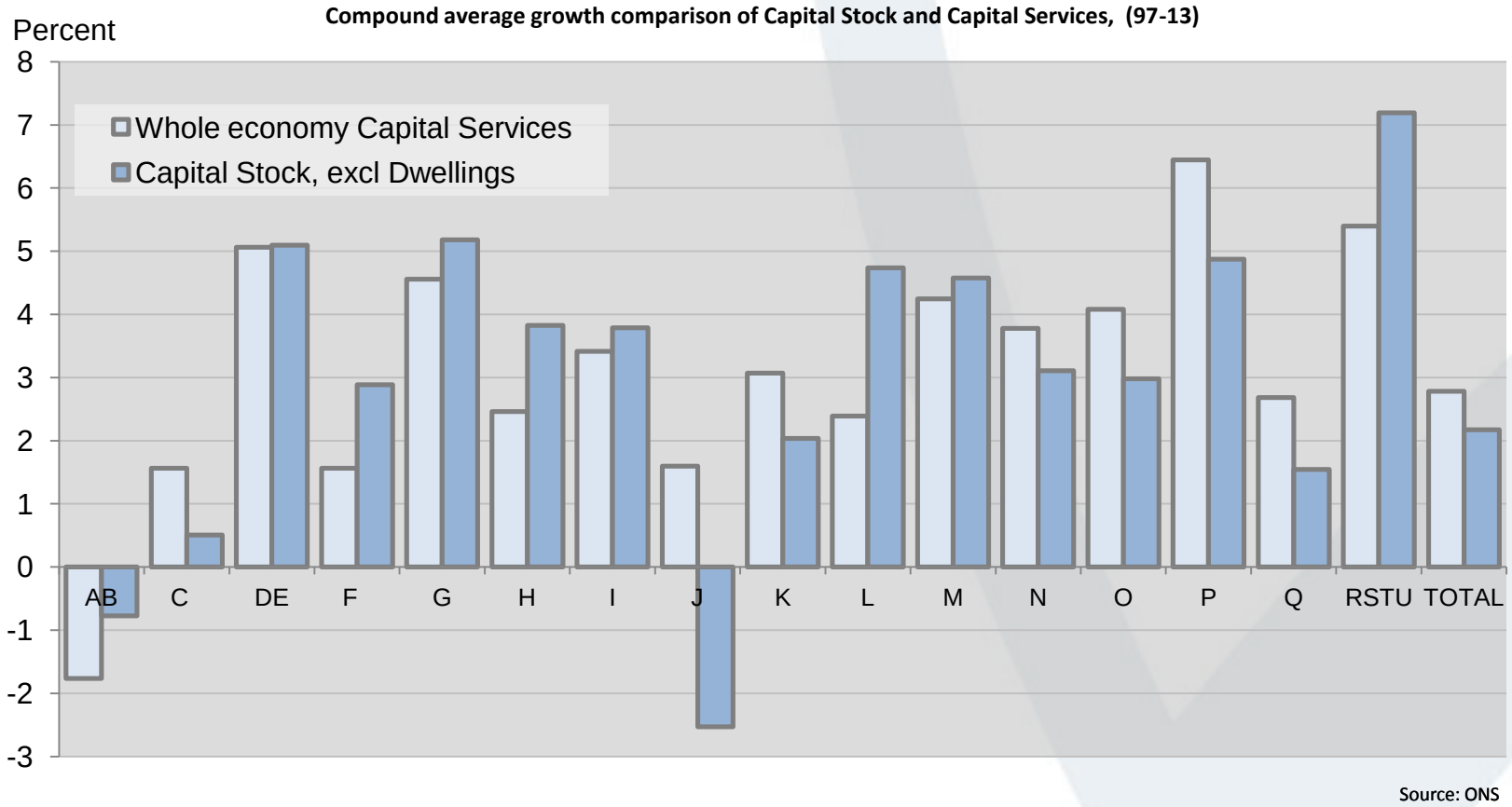
Buildings (excl dwellings) growth



Note much smaller scale

Pre-downturn, purchased software capital services grow on average 16% a year between 97-08, buildings grow around 3% a year (note, purchased software accounts for around 5% user cost share, own account covers remaining approx 7%)

Capital Stocks, Capital Services



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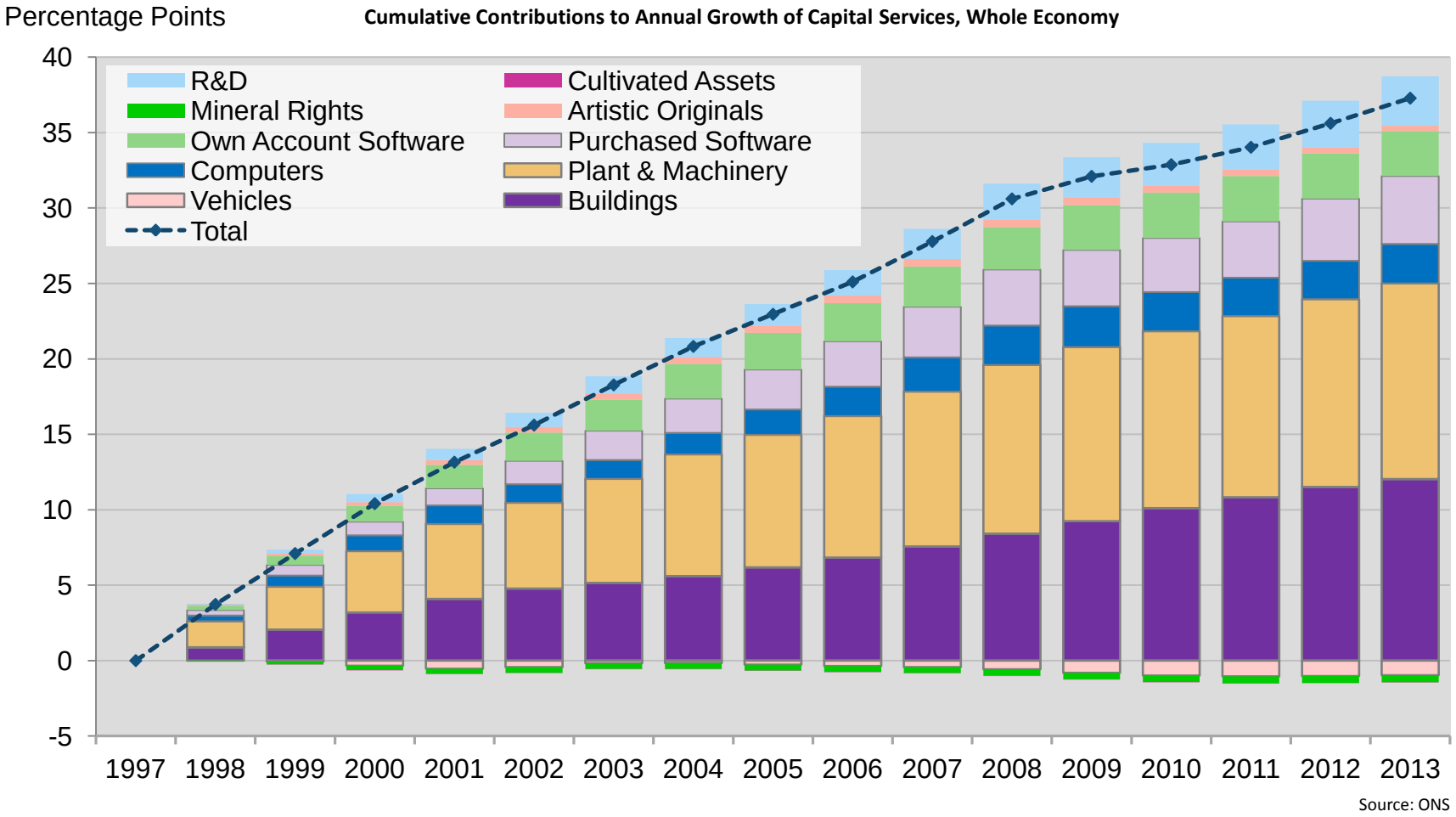
Capital Services- Whole economy



Multi-factor Productivity

Applies a growth accounting framework to split output growth into the relative contributions of labour and capital inputs, and a residual component called MFP.

Inputs:

- **Quality adjusted labour input**
  - Assumes that workers are paid their marginal product
  - Weights the changes in hours worked by share in total labour income

- **Capital Services**
  - Assumes different assets 'cost' their marginal product
  - User costs generate weights used to aggregate changes in productive capital stocks of different assets

Multi-factor Productivity

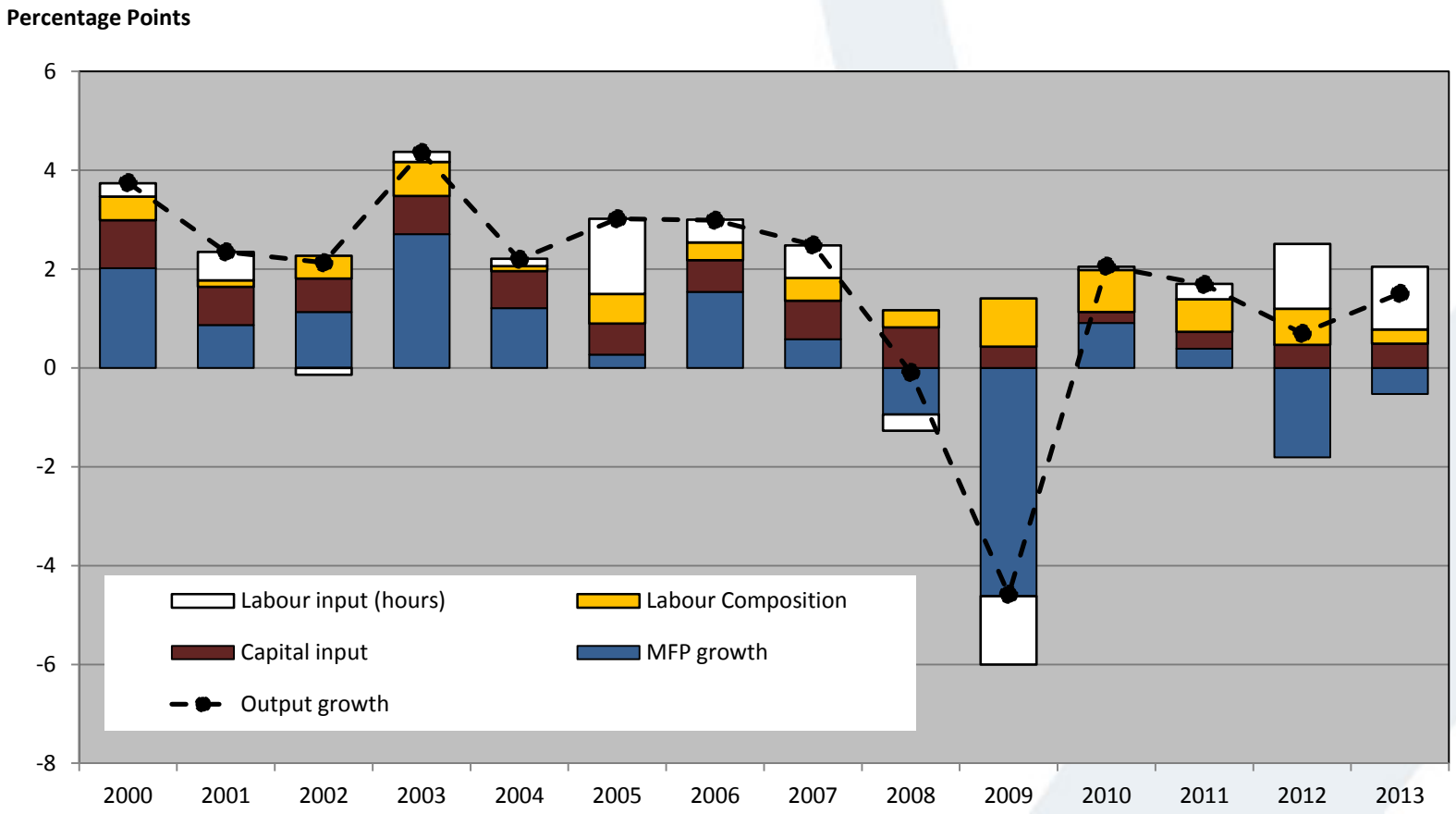
New MFP and Capital Services publications released on 23rd Jan 2015

What's New?

- 2013 estimates
- 1970-1992 whole economy and manufacturing estimates
- Revisions to include new data

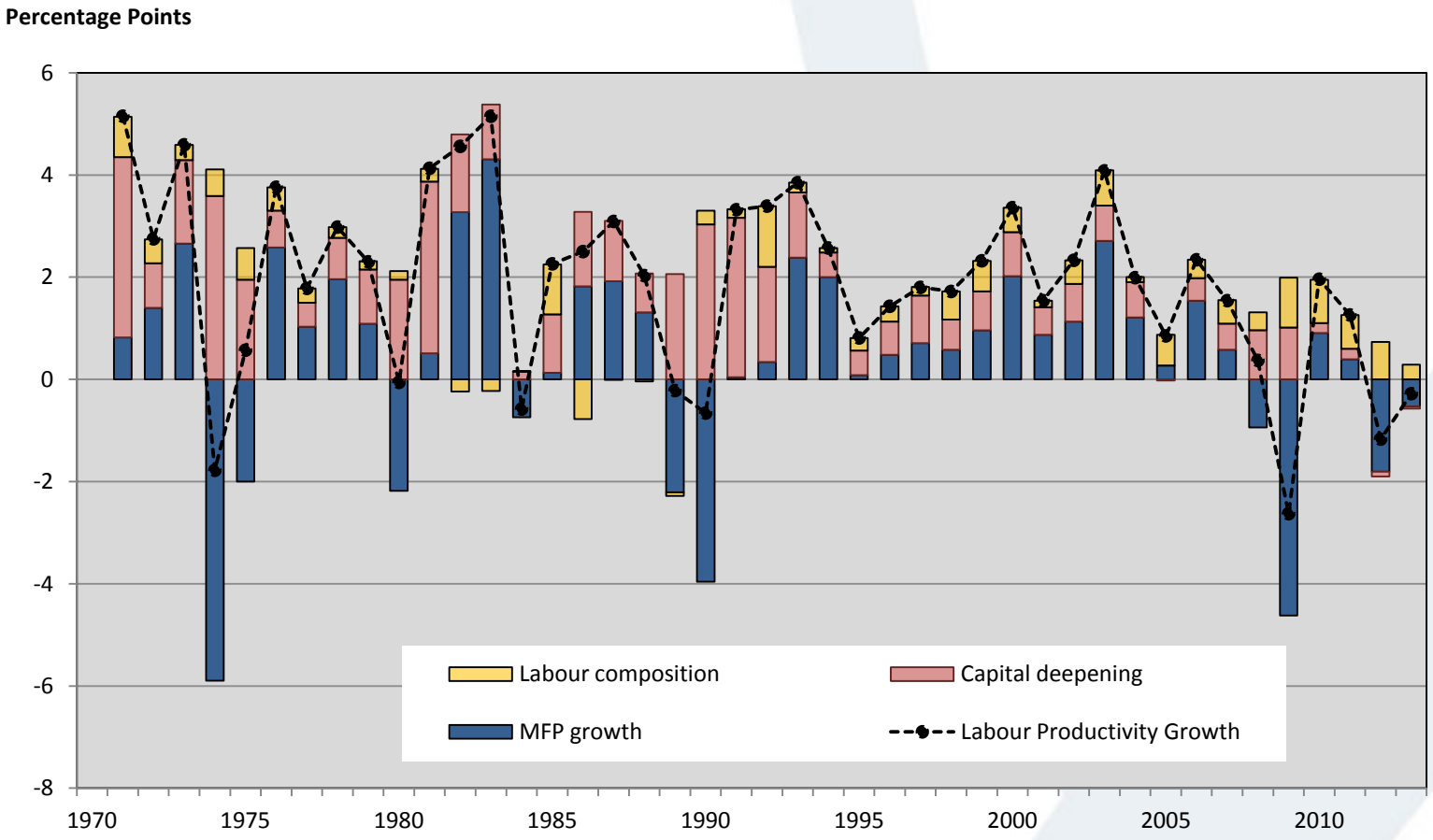
Results

Decomposition of output growth, estimates to 2013



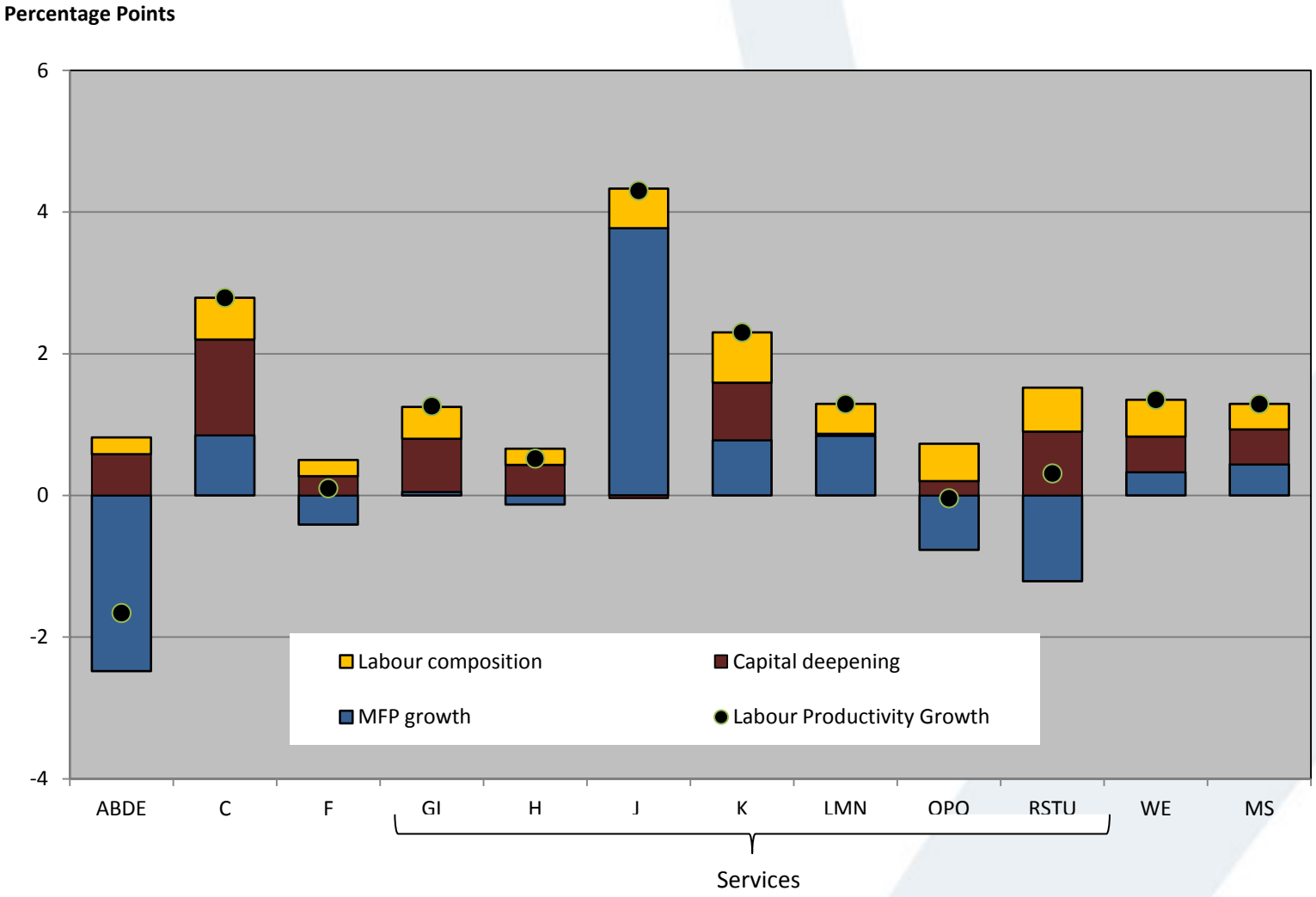
Results

Decomposition of labour productivity growth, estimates to 2013



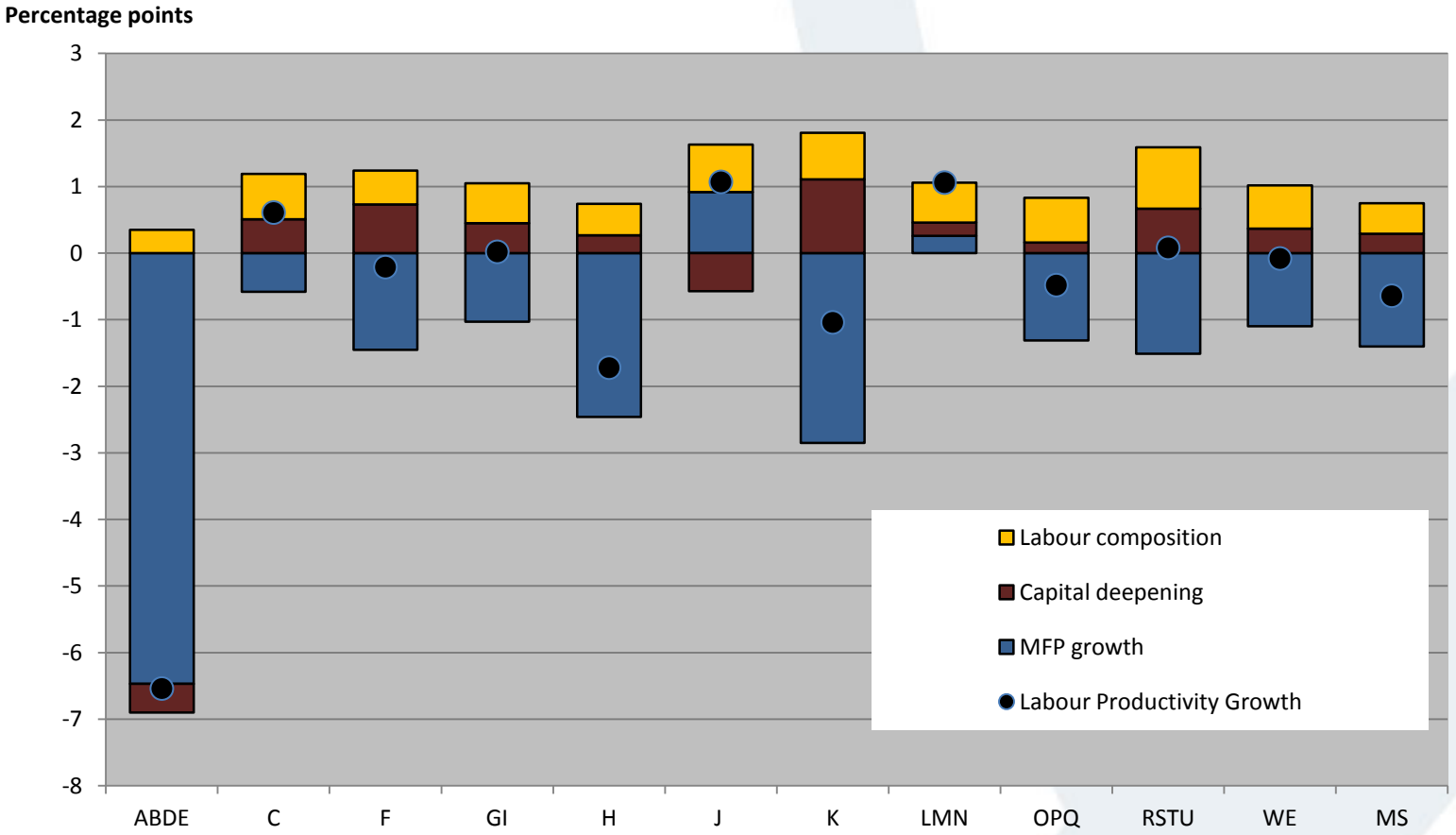
Results

Decomposition of Labour Productivity growth, average industry estimates 1998 to 2013



Results

Decomposition of Labour Productivity growth, average industry estimates 2008 to 2013



Any questions?